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NRO

20 July 1965

Dear Cy:

I have noted Dr. McMillan's memorandum of 13 July addressed to you and me on the subject of a New Satellite Search/Surveillance System. This memorandum indicates that the Director of NRO may be already planning to decide on a specific system.

You will recall that you and I discussed this matter and we agreed that any decision should await the technical advice of the Land Panel of PSAC which is meeting on 21 July. Their guidance will be most helpful to you and to me in making a final judgment on any specific search and surveillance system.

I trust that the foregoing conforms to your understanding of how we plan to proceed.

Sincerely,

/s/ "Red"

W. F. Raborn

The Honorable Cyrus R. Vance
Deputy Secretary of Defense
The Pentagon
Washington, D. C.

Original by O/DDS&T/SPS:JNMcMAHON [redacted] (16 July 65) 50X1
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16 July 1965

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT : Reply to Dr. McMillan's Letter of 13 July 1965 relative to New Search System

The attached letter has been prepared for your signature as a response to Dr. McMillan's letter of 13 July. I have coordinated the suggested reply with John Bross, who concurs with it as is. It is recommended that you sign the attached letter.

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ALBERT D. WHEELON
Deputy Director
for
Science and Technology

Attachment: a/s

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DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE UNDER SECRETARY

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July 13, 1965

MEMORANDUM FOR DEPUTY SECRETARY OF DEFENSE
DIRECTOR, CENTRAL INTELLIGENCE AGENCY

SUBJECT: New Satellite Search/Surveillance System

The purpose of this memorandum is to provide a status report on NRO activities toward meeting satellite search and surveillance requirements in the 1967 and subsequent time period.

In-house NRO analyses, in conjunction with competitive contractor parametric studies and technology investigations, have progressed to a point that permits decisions to be made with high confidence about the overall system configuration. The NRO is now in a position to proceed with an orderly program toward a first launch of a new system in the last quarter of FY 67. The paragraphs which follow briefly describe the major elements of the system.

Camera Sub-system

The NRO has continued to fund both the Eastman Kodak and Itek efforts. The basic characteristics of each camera sub-system are essentially unchanged from the material presented to Dr. Land's panel last February. The soundness and feasibility of both designs have been further verified. The EK proposal remains the most straightforward design, with the least technical risk, and it has been selected as the primary camera sub-system.

We will fund a back-up camera development to the EK effort, however, and build approximately five flight articles, scheduling at least three for flight test. For this purpose, I propose to compete the present Itek and Perkin-Elmer designs, and select the most promising as an alternate camera configuration within the next few months.

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Spacecraft

Both Lockheed and General Electric have been on contract with the NRO, since last December, accomplishing design studies on spacecraft of varying capabilities in conjunction with the payload contractors. The Lockheed designs have been based on advanced versions of the AGENA vehicle; the General Electric designs generally have been evolutions of their GAMBIT vehicle.

We have analyzed most thoroughly the cost and effectiveness of different orbital lifetimes for the system - from a minimum of about 8 days, to a maximum of 30 days or more. The studies rather conclusively indicate that considerably greater effectiveness can be realized with a system possessing an orbital lifetime of 20-30 days.

In that orbital lifetime range, the General Electric design proposals are clearly superior to those of LMSC. Accordingly, no further spacecraft effort will be supported at LMSC after mid-July. The GE spacecraft selected will have the following major characteristics:

1. Possess an orbital lifetime of approximately 25 days;

2. Accommodate the EK, Itek, or Perkin-Elmer camera subsystems, and carry at least 1000 lbs of film;

3. Have an integral orbit-adjust system;

4. Have redundant command and control, attitude control, etc. sub-systems for high reliability;

5. Have an integral and improved Stellar-Index Camera subsystem;

6. Be compatible with planned improvements in our space-net and all other elements of the support forces;

The spacecraft design is based on proven technology and should not be the pacing item toward first launch and an early operational capability.

Booster

In conjunction with the several spacecraft designs, the NRO has analyzed all boosters which might reasonably be employed. Although several combinations are possible, the optimum booster for this 20-30 day system is the TITAN-IIIX, with two two-segment strap-on solids (120" diameter). This combination will boost more than 13,000 lbs of payload into a polar orbit.

Accordingly, I have selected the TITAN-IIIX with the two-segment strap-ons (a shred-out of the TITAN-IIIC Development Program) as the system booster and am preparing appropriate procurement instructions to the TITAN SPO.

In this regard, it will be necessary to modify an additional launch pad at Point Arguello. Pad 4 has been selected for the TITAN-IIIX with the 120" strap-on solids. PALC II will thus become a TITAN III complex, since Pad 3 is now being modified to a TITAN III-X/AGENA capability (for GAMBIT-CUBED). Additionally, sufficient AGE will be added to the MOL ILC to use that facility, when available, as a back-up and alternate facility for both pads 3 and 4.

Re-entry Vehicles

Planned orbital lifetimes, the number of days required for access to the Sino-Soviet Bloc, and total film weight to be carried were key factors in determining the number of RV's to be employed. For example, twenty-five day lifetimes will provide complete photographic access to the entire Sino-Soviet Bloc at least four times in a single mission (ranging from four accesses to all portions of the southern latitudes, to more than twelve accesses in the northernmost areas). In view of these and other factors, we have selected four medium-sized RV's as the standard configuration. This will permit the return of a bucket of film after each complete photographic access to the entire Sino-Soviet Bloc.

The four RV-configuration could be used in crisis-management situations and return a considerable amount of film daily. However, since this would not represent the most efficient use of the system (in view of its orbital lifetime), I plan to continue investigating the use of many small RV's -- perhaps, as many as 16 -- as an alternate configuration. I will keep you apprised of our actions in this regard.

Summary

The system described above will be highly cost-effective. Under average weather conditions, two missions can provide cloud-free photography of approximately 90 percent of the entire Sino-Soviet Bloc, with all photography at 3-foot (nadir) to 5-foot (edge) resolutions. USIB's requirements for surveillance, rather than search, may therefore become the determining factor in the number of launches required annually. These requirements, as presently envisaged, could be satisfied by one launch each 60 days for surveillance purposes.

I feel it would be appropriate for the two of you to review the program in some depth in the next 30-60 days. At least two hours will be required for this purpose. If you agree, I will make the necessary arrangements.

Brockway McMillan
Director
National Reconnaissance Office

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